

Remarks

Claims 5-18 and 20-35 are pending in the present application. Claims 5 and 9 are amended herein. The amendment to claim 5 deletes the expressions "*for receiving a liquid to be processed, said chamber extending straight between said bottom wall and said upper opening, and*" and "*said chamber having the shape of a cuboid, having side lengths which are substantially equal,*".

Claim 9 likewise is amended to delete the expression "*said chamber having the shape of a cuboid, having side lengths which are substantially equal,*". No new matter is added by these deletions. Accordingly, entry of the amendments to the claims is respectfully requested.

Claim Rejections under 35 U.S.C. § 112 – Final Office Action of March 6, 2008

Claims 5-18 and 20-25 were rejected in the Final Office Action of March 6, 2008 under 35 U.S.C. § 112, first paragraph, for failure to comply with the written description requirement. Specifically, claims 5 and 9 were said to state that the outer shape of the chamber is approximately a cuboid. The Office Action stated that the specification provides support for a chamber with an inner cuboid shape, but none for an outer cuboid shape. The rejection is made moot by the deletion of the objected expression in claims 5 and 9. Accordingly, withdrawal of the rejection under 35 U.S.C. § 112 is respectfully requested.

The Final Office Action of March 6, 2008 did not any claim rejection other than those under 35 USC § 112. According to the practice before the USPTO (see MPEP 706.07), the Examiner must review and reiterate all outstanding objections in the Final Office Action. Thus, if any other rejection was outstanding, it should have been reiterated in the Final Office Action, or acknowledged as having been overcome. Absent such reiteration or acknowledgement, the Applicants have no way to know that if there are any other objections beyond those stated in the Final Office Action of March 6, 2008. The Advisory Action mailed on May 12, 2008 likewise did not explicitly state which objections are outstanding and currently of record. Applicants respectfully request all outstanding rejections be made of record in any subsequent Office Action. To ensure a complete record, Applicants below address the rejections made in the Non-Final Office Action mailed on August 27, 2007, which were not acknowledged by the subsequent Office Actions.

Claim rejections under 35 U.S.C. § 103 - Non-Final Office Action of August 27, 2007

Rejections of Claims 9-12 and 17-24

In the Non-Final Office Action of August 27, 2007, claims 9-12 and 17-24 were rejected under §103(a) over Lehmann, EP 1161984 in view of Sharpe, US 2004/0207840. The Office Action stated that Lehmann teaches a vessel that “includes a tubular body (Figure 1:15).” Lehmann does not expressly state that the chamber is a straight tubular chamber. Sharpe teaches a cuvette that is a rectangular prism. The Office Action concluded that “it would have been obvious to modify the chamber disclosed by Lehmann so that it is in the form of a cuboid, having side lengths which are substantially equal.” This rejection is made moot by the amendment to the claims herewith presented.

In fact, Lehmann does not teach or suggest tubular chambers. Contrary to the statement in the Office Action, the process chamber (33) on Figure 5 of Lehmann is not tubular but a rectangular prism, when looking at the outer shape of the cartridge on Figure 1. The Applicants have previously supplied a dictionary definition of “tubular” or “tube” as “hollow elongated cylinder”. As is clear from Figures 1 and 5 of Lehmann, the chamber disclosed therein is a rectangular prism and is by definition rectangular in all cross-sections. Both the inner and the outer walls of the chamber lack any curvature. Clearly, neither Lehmann, nor Sharpe, nor their combination teach a vessel with a tubular (cylindrical) chamber.

In view of the amendments, the prior art must teach or suggest a tubular chamber. Specifically, a person of ordinary skill must have a reason to so modify the shapes of the chambers taught by either Lehmann or Sharpe. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *See* MPEP 2143.01(V), citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

In fact, a tubular chamber is incompatible with the intended purpose of both devices. Lehman states that it is essential that the surfaces of the chip, the chamber and the slot be co-planar (*see* [0035]). This would not be possible if the chamber is tubular. A further drawback of the tubular chamber would be reduced volume. The volume of a cylinder is smaller than the volume of a rectangular prism with a side equal to the diameter of the cylinder¹. Similarly, in Sharpe, a tubular chamber would impair the performance of

¹ Compare the area of a square with a side 1 cm (1 cm²) and a circle with a diameter 1 cm (pi x (0.5)²=0.785 cm²)

the device. The cuvette is placed in the path of light in order to measure optical density of the sample. If the cuvette is tubular, reproducible measurement would become impossible. If a tubular cuvette is placed slightly off center, the light would travel through less than a full diameter of the cylinder and give a smaller absorbance reading. Therefore the optimal shape of the cuvette is a rectangular prism. Changing it to a tube (cylinder) would render the chips of Lehmann unsuitable for its intended purpose. A person of ordinary skill trying to optimize either Lehmann or Sharpe would therefore have no reason or motivation to modify rectangular chambers into the tubular chamber taught by the claim because it would ruin both devices.

In view of the foregoing, the Applicants respectfully request reconsideration and withdrawal of the §103(a) obviousness rejection over Lehmann in view of Sharpe.

Claims 10-12 and 17-24 depend ultimately from claim 9 and therefore incorporate all the limitations of that claim. As discussed above, there would be no motivation to combine Lehmann with Sharpe to arrive at the device claimed in claim 9. Therefore obviousness rejections of the claims dependent on claim 9 over Lehmann in view of Sharpe may not be sustained. Reconsideration and withdrawal of the rejections are respectfully requested.

Rejection of Claim 5

Claim 5 was rejected under §103(a) over Lehmann in view of Sharpe and Combs (US 4,812,294). The rejection is respectfully traversed.

The Office Action stated that the combination of Lehmann and Sharpe discloses the reaction vessel but not the vessel holder capable of moving along a predetermined elliptical trajectory. Combs teaches that "the vessel holder is moved along a predetermined trajectory for causing mixing of fluids within the vessel."

In Combs, the centrifuge wells are placed in vessel holders and move along a predetermined trajectory. However, the trajectory is not elliptical but perfectly circular. As quoted in the preceding section, a modification is not obvious if it would render the prior art unsatisfactory for its intended purpose. See MPEP 2143.01(V). In fact, it is an axiom of physics that any deviations from the circular trajectory disrupt the centrifugal process and at high speeds even destroy the sample and the apparatus. Therefore a person of ordinary skill would not be motivated to spin the Combs' centrifuge along the elliptical path taught by the Applicants.

Furthermore, the device of Combs serves a purpose opposite to the purpose of the Applicants' device. The purpose of a centrifuge is to separate components of a solution.

"Centrifuge" is defined as "an apparatus that rotates at high speed and by centrifugal force separates substances of different densities, as milk and cream." (See Dictionary.com unabridged v1.1). In contrast, the Applicants' invention expressly teaches an optimal trajectory for effectively mixing substances. (See p. 11, lines 19-27). Therefore a person of ordinary skill would not have consulted Combs for the purpose of designing a vessel holder and the trajectory for the vessel holder suitable to mix substances.

In summary, there would be no motivation to a hypothetical combination of Lehmann with Sharpe and Combs to arrive at the device of claim 5. In fact, the Combs reference may not even be a part of the hypothetical combination because it describes a device with a contrary purpose. Based on the foregoing, reconsideration and withdrawal of the §103(a) rejection of claim 5 are respectfully requested.

Rejection of Claims 6-8

Claims 6-8 were rejected under §103(a) over Lehmann in view of Sharpe, Combs and further in view of Frackleton (US 5,133,937). The rejection is respectfully traversed.

The Office Action stated that Lehmann, Sharpe and Combs disclose the apparatus of claim 5 as set out in the corresponding rejection of that claim. Frackleton teaches a vessel, a vessel holder and various heat transfer elements.

Claims 6-8 depend from claim 5 and therefore incorporate all the limitations of that claim. As set forth in the preceding section, a hypothetical combination of Lehmann, Sharpe and Combs does not teach or suggest the Applicants' invention as described in claim 5. Frackleton teaches an analytical system with a removable cartridge. The cartridge is entirely flat, i.e. shaped as a narrow rectangle. There is no teaching or suggestion of a tubular cartridge. A rejection of the dependent claims under §103(a) is improper for that reason alone.

Moreover, even if one assumes that a tubular cartridge according to Sharpe could be substituted in the device of Lehmann, a tubular cartridge would be incompatible with the purpose of the Frackleton device: a flat side of the cartridge achieves maximum contact and maximum heat exchange inside the device. A tubular cartridge with a curved side would necessarily have a smaller contact area and inferior heat exchange properties.

For the foregoing reasons an obviousness rejection of claims 6-8 over Lehmann, Sharpe, Combs, Frackleton or their combination is not warranted. Reconsideration and withdrawal of the §103(a) rejection are respectfully requested.

Rejection of Claims 13-16

Claims 13-16 were rejected under §103(a) over Lehmann in view of Sharpe and further in view of Frackleton. The rejection is respectfully traversed.

With respect to claims 13-16, the Office Action stated that Lehmann and Sharpe teach the device described in claim 9 as set out in the corresponding rejection of that claim. Claims 13-16 depend directly or indirectly from claim 9. As explained above, there is not motivation to a hypothetical combination of Lehmann and Sharpe to arrive at the invention of claim 9. Therefore rejection of the dependent claims under §103(a) is improper for that reason alone.

Claim 13 covers electro-optical detection of the sample through a transparent zone in the reaction vessel. Frackleton discloses a transparent acrylic plate for visual observation of the liquid in the cartridge. Simple observation desired by Frackleton would still be possible. Therefore Frackleton does not teach or suggest a device capable of electro-optical detection.

Claims 14-16 cover heating elements in connection with the reaction vessel. Frackleton discloses heating and cooling elements in connection with the flat cartridge. As explained above, a tubular vessel of the present invention would not be compatible with the Frackleton device. Therefore a person of ordinary skill would have no reason to modify the Frackleton cartridge into a vessel of the present invention.

For the foregoing reasons an obviousness rejection of claims 13-16 over Lehmann, Sharpe, Frackleton or their combination is not warranted. Reconsideration and withdrawal of the §103(a) rejection are respectfully requested.

Rejection of Claim 25

Claim 25 was rejected over Lehmann in view of Sharpe and further in view of Mochida (GB 2129551). Mochida discloses a bar code label placed on the wall of a vessel holding a sample. The rejection is respectfully traversed.

The Office Action stated that Lehmann and Sharpe teach the device described in claim 9 as set out in the corresponding rejection of that claim. Claim 25 depends from claim 9. As explained above, there is no motivation to a hypothetical combination of Lehmann and Sharpe to arrive at the invention of claim 9. Mochida does not cure this deficiency. Therefore reconsideration and withdrawal of the §103(a) rejection of claim 25 over Lehmann in view of Sharpe and further in view of Mochida are respectfully requested.

Conclusion

It is believed that claims as amended are in condition for allowance. As stated above, this submission is accompanied by a Request for Continued Examination and an RCE fee under 1.17(e).

The deadline for filing the instant RCE is computed from the mailing date of the Final Office Action, because the Advisory Action was mailed prior to the end of the three months shortened statutory period. The Final Office Action was mailed on March 6, 2008. The three months shortened statutory period for filing the RCE was therefore initially June 6, 2008. As a consequence, Applicants respectfully request a 1-month extension of time to respond to the Final Office Action mailed March 6, 2008. With the granting of this request, the response time is re-set to July 6, 2008 which is a Sunday and extended to July 7, 2008. The commissioner is hereby authorized to charge the fee due under 37 CFR § 1.17(a)(1), to Deposit account No. 50-0812. No other fee is believed to be due at this time, however, the Commissioner is authorized to charge any fee deficiency, or credit any overpayment, to Deposit Account No. 50-0812. No other fee is believed to be due.

If the Examiner believes a telephone conference would expedite prosecution of this application, he may telephone the undersigned directly at 925-730-8554.

Respectfully submitted,

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